

SUBSTITUTE CLAIMS

1-8. (withdrawn)

9. (Currently Amended) An ultra wideband transmitter to transmit an ultra wideband signal, said transmitter comprising:

a switching device that produces a pulse of energy in response to current flow through a conduction path thereof,

~~a timing circuit to gate the switching device,~~

a singly-terminated filter network to receive and dissipate said pulse of energy during a resonant cycle thereof, and

a timing circuit to gate the switching device to release a said pulse of energy directly into the filter network and to pinch-off ~~the~~ a conduction path ~~after release of said pulse of said switching device substantially within a first current cycle thereof whereby to reduce energy loss within the switching device and to deliver a substantial portion of said energy to the filter network.~~

10. (Currently Amended) The transmitter of claim 9 wherein said switching device comprises a field-effect transistor, and further includes a bias voltage applied to said transistor to effect production of said pulse in response to said timing circuit.

11. (Currently Amended) The transmitter of claim 10, wherein said filter network includes an antenna that controls the transmitted ultra wideband signal in at least one of center-frequency, bandwidth, and impedance value of a load.

12. (Currently Amended) The transmitter of claim 9, wherein said filter network includes a series inductor sectioned into two sections, and

wherein said switching device includes a drain terminal coupled to said filter network between said sectioned inductors whereby to produce opposing resonant potentials at said drain terminal after ~~issuing~~ issuance of said pulse.

13. (Currently Amended) The transmitter of claim 12, wherein said timing circuit ~~is operative to turn~~ pinches off the conduction path of said transistor when current in the drain terminal approaches or nears zero after release of said pulse of energy whereby to reduce switching transients.

14. (Currently Amended) The transmitter of claim 11, wherein circuit elements of said filter network ~~takes~~ take into account ~~the~~ parasitic capacitance of said transistor during non-conduction to provide said at least one of center-frequency and bandwidth.

15. (Currently Amended) An ultra wideband transmitter to supply a spectrally filtered UWB signal to a load device comprising:

- a switching device having a gate to produce a UWB pulse,
- a singly-terminated resonant circuit that provides a desired spectral response for said UWB pulse, said resonant circuit including a series inductor and a shunt capacitor,
- a timing circuit to drive the gate of the switching device to ~~effect~~ initiate release of ~~the~~ a current pulse into the inductor of said resonant circuit ~~by immediately switching and to pinch~~ off a conduction path of the switching device after ~~issuing~~ issuance of the current pulse so as to substantially eliminate dissipation of energy across said switching device during resonance of said resonant circuit, and
- a load device coupled to an output of said resonant circuit to dissipate energy ~~directly into the load device~~ of said resonant circuit

during said resonance, whereby to efficiently produce said spectrally filtered UWB signal across said load device.

16. (Currently Amended) The transmitter of claim 15, wherein said load device comprises an antenna and said timing circuit switches off said switching device at or near a zero ~~crossings~~ crossing of ~~current flowing~~ through a current cycle of said transistor switching device.

17. (Currently Amended) The transmitter of claim 16, wherein said series inductor is split into two sections, and said ~~transistor switching device~~ device is connected between said sections to produce opposing currents during between said sections after release of pulse ~~therebetween~~.

18. (Currently Amended) An ultra wideband transmitter that produces a band-limited ultra wideband signal of a desired energy level, said transmitter comprising a pulse conditioning circuit having a predetermined spectral response, a source of power to apply a bias potential across ~~an inductor of a filter network~~ a switching device, and a timing circuit that controls a said switching device to effect release of a current pulse into the pulse conditioning circuit ~~in a way~~ and to switch off said switching device during a falling current cycle thereof whereby to dissipate a majority of pulse energy of the pulse conditioning circuit into a load device instead of said switching device.

19. (Currently Amended) The ultra wideband transmitter of claim 18, wherein said switching device comprises a field-effect transistor, and said timing circuit effects opening of a conduction path of the transistor to produce said current pulse by operating said transistor in a non-linear mode to pinch-off the conduction path after release of said pulse.

20. (Currently Amended) The ultra wideband transmitter of claim 19, wherein said pulse conditioning circuit comprises a resonant circuit, and said timing circuit releases said pulse ~~in accordance with a resonant cycle of said resonant circuit~~ before completion of a current cycle through a drain terminal of said switching device.

21. (Original) The ultra wideband transmitter of claim 19, wherein said timing circuit controls said gate to effect pinching-off the conduction path when drain current of said transistor reaches or is near zero.

22. (Currently Amended) The ultra wideband transmitter of claim 19, wherein ~~said~~ a load device of said pulse conditioning circuit comprises an antenna.

23. (Currently Amended) A highly-efficient ultra wideband transmitter having an power conversion ratio greater than 50% comprising:
an antenna,
a resonant circuit ~~having~~ including a singly terminated inductor-capacitor network coupled directly to said antenna,
a switching device that applies a ~~voltage potential~~ pulse of energy across an inductor of the inductor-capacitor network of said resonant circuit, and
a timing circuit to gate the switching device to open a conduction path thereof to supply a said pulse directly to said resonant circuit, and to ~~immediately~~ pinch-off the conduction path of the switching device during a current cycle of said switching device after release of said pulse to said resonant circuit, whereby to dissipate greater than 50% of pulse energy of said resonant circuit into said antenna instead of said switching device.

24. (Currently Amended) The transmitter of claim 23, wherein said

timing circuit effects pinching-off said switching device when drain current through said ~~transistor reaches or is near~~ switching device approaches or nears zero after release of said pulse.

25. (Currently Amended) The transmitter of claim 23, wherein said timing circuit effects control to ~~gate~~ terminate said pulse at a given point during ~~resonant cycles of said resonant circuit~~ a falling portion of a first current cycle of said switching device .

26-27. (withdrawn)